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TECHNICAL NOTE

AN ALTERNATIVE TARGET IN THE STUDY OF SCHEDULE-INDUCED AGGRESSION IN PIGEONS

One problem in the study of schedule-induced aggression in pigeons is the selection of an adequate target. In several instances, researchers have employed a live restrained target, against which attacks may be directed. While a live target may control high rates of attack responses from experimental subjects, this type of target presents several disadvantages, which have made attractive the search for an alternative target.

Cohen and Looney (1973) utilized a mirror target, against which attacks could be directed, and found that attack was obtained while circumventing the problems associated with the use of live targets. They stated that the mirror target (1) provided a more stable target within and across experimental sessions, (2) eliminated severe injury that occurs to unshielded live targets and often results in loss of experimental time, (3) eliminated spuriously high rates of target responding, due to contact bounce or movement of the target, and (4) reduced the cost of the target. Other researchers have used a taxidermically stuffed bird as an alternative to a live target (Azrin, Hutchinson, and Hake, 1966). One limitation of both the mirror and/or stuffed target is that not all experimentally naive subjects attack these targets, whereas attack is typically obtained when a live target is presented. Also, a second disadvantage to the mirror target is that aggression is limited to a beak-to-beak attack, whereas attack against live or stuffed targets may be directed to the neck and chest regions as well. Two-dimensional pictorial targets have eliminated many of the problems associated with the use of live targets, but, again, a major disadvantage is that many experimentally naive pigeons fail to attack them (Looney, Cohen, and Yoburn, 1976).

An alternative technique found to be useful is the shielded live target (see Figure 1) described below.

At the rear of a standard experimental pigeon chamber, on the wall opposite the response key, a 16- by 7-cm rectangular opening exposed a 23- by 11.5- by 26-cm enclosure containing a live target bird, and the same live target was used for all subjects. The target enclosure was constructed of wire mesh, which allowed for adequate ventilation. The enclosure restrained the target in a position facing the main chamber, but allowed the target adequate room for bobbing, weaving, and counteraggressing. A 2-mm thick clear plastic shield separated the live target from the aggressor bird and prevented any physical contact between the two animals. The shield was hinged at the top, permitting it to swing back toward the target when a peck was made on the plastic surface. A hole was drilled and tapped to accept a 1.5-cm bolt at the base of the shield, and this bolt was aligned with a microswitch located in the target chamber. Any deflection of the shield by the aggressor bird closed the microswitch and was counted as an attack. By turning the bolt at the base of the shield in either a clockwise or counter-clockwise direction, the pressure needed to activate the microswitch could be regulated with precision.

During early tests with the attack apparatus, it was noted that the target animal would sometimes place its body directly against the attack shield. With the target in this position, many attacks were not being recorded because the shield could not be deflected against the microswitch. To eliminate this, a second 2-mm clear plastic shield was bolted in place and this separated the target from the hinged shield. Also, rubber bands stretched behind the hinged shield eliminated the possibility of multiple switch closures due to a bouncing of the shield.

In an attempt to compare the attack-inducing properties of the mirror, stuffed, and protected live target, six subjects were systematically exposed to fixed-ratio (FR) requirements of 80, 100, and 120 in the presence of each target where completion of a ratio allowed access to grain for 4 sec. The pressure needed to activate the microswitch for all targets was constant at approximately 0.30 N. Each target was presented to subjects for 14 sessions at each FR level. Subjects 7 and 8 were presented the sequence of stuffed, mirror, and live target; Subjects 5 and 6 were presented the sequence of mirror, live, and stuffed target; and Subjects 2 and 3 were presented the sequence of live, stuffed, and mirror target. The respective sequence for each sub-

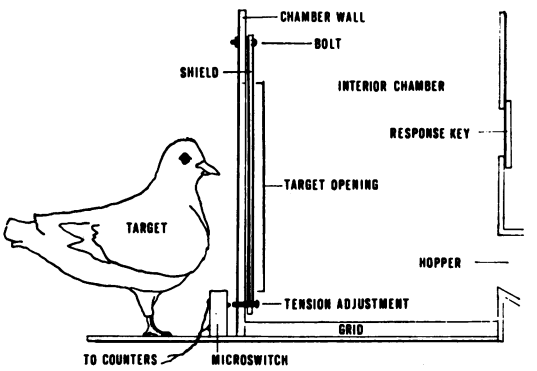

Fig. 1. Schematic of target restraining and attack apparatus.

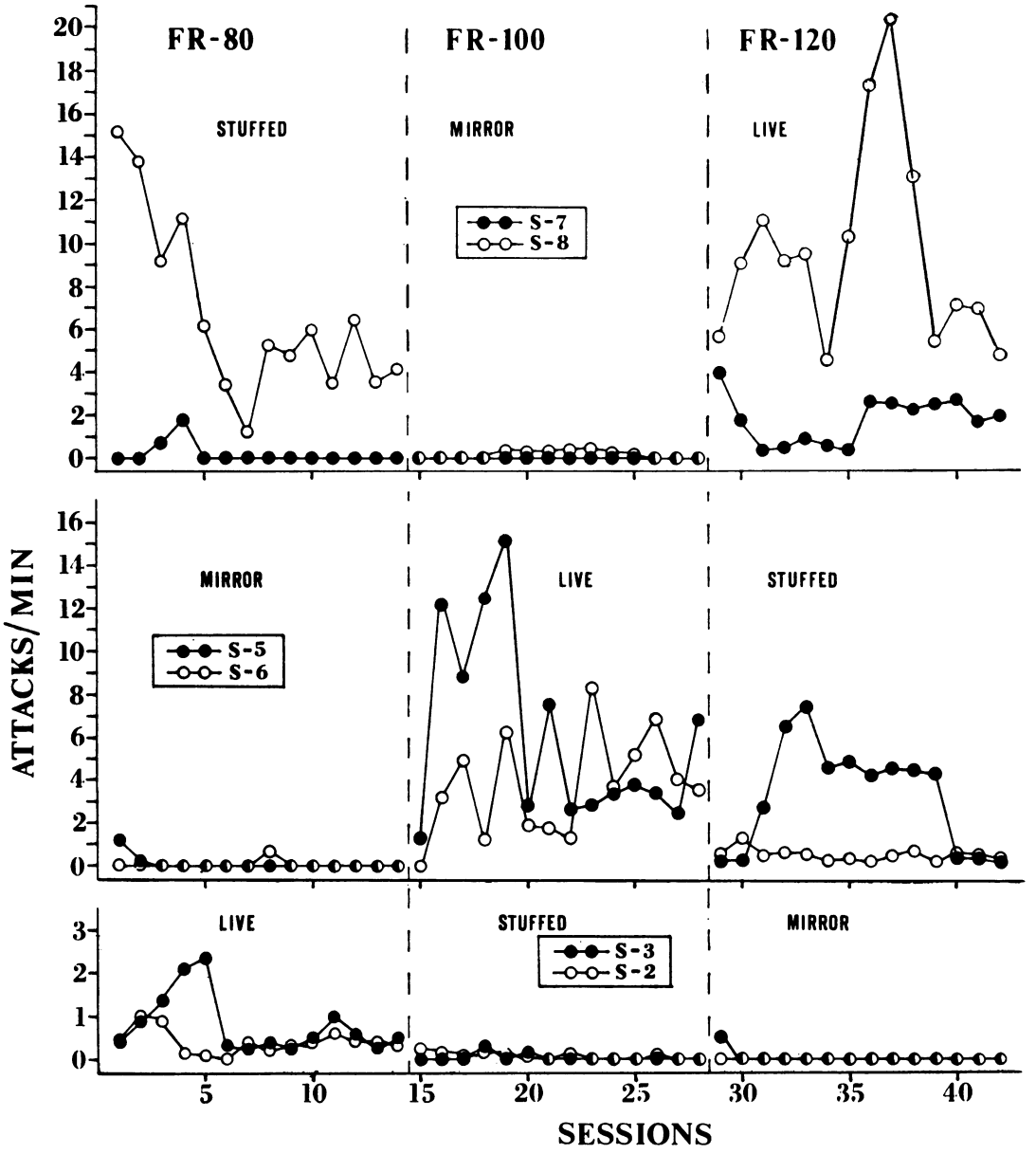

Fig. 2. Mean number of attacks per minute for all subjects over all sessions as a function of the FR schedule for each of the three targets presented. The dashed vertical lines correspond to changes in schedule conditions. The target condition in effect is identified at each ratio level.

ject remained constant through all FR requirements. Schedule changes coincided with target changes to reduce the possibility of attack deterioration over time that is often associated with a fixed-ratio requirement.

The number of attacks per minute for all subjects over all target and FR conditions is presented in Figure 2.

The present data indicate that the live protected target controlled higher rates of attack over all subjects than did the mirror or stuffed targets, regardless of the FR level in effect when the live target was introduced. Thus, the live target has all the advantages of both the mirror and stuffed targets while eliminating the problems associated with the use of restrained unprotected targets. The same protected live target can be used for all subjects, thus eliminating the variables associated with the use of multiple targets, while at the same time eliminating the possibility of target injury. In addition, the present technique permits the presentation of a moving, counteraggressing target while at the same time eliminating target-aggressor contact and the beak-to-beak attack restrictions inher-

ent to mirror responding. Finally, the present technique seems useful in that attack against the live protected target was found to occur in subjects that did not aggress toward either a mirror or stuffed target.

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